



Historical Fisheries Data Can Help Management, Recovery In Gulf Of Maine, UNH Researchers Report

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Dec 10, 2009

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The small schooner pictured is the type used in the coastal fishery around the 1860s. A logbook from a vessel about this size that sailed out of Jones Cove on Frenchman's Bay was part of the UNH study. Image courtesy of the William Burgess Leavenworth Postcard Collection.

DURHAM, N.H. –An interdisciplinary team of researchers from the University of New Hampshire has published findings in *Fish and Fisheries* showing that Atlantic cod (*Gadus morhua*) landings in the Gulf of Maine were twenty times greater in 1861 compared to today's catch.

Using fishermen's logbook data from Frenchman's Bay, Maine, and other New England communities, the team of fourteen fisheries scientists, social scientists and historians estimated that 78,000 metric tons of cod were caught in the Gulf of Maine at the time of the Civil War. They also found evidence about the conditions of the marine ecosystem that supported these cod. Most of the fish were caught near shore, attracted by huge schools of herring and menhaden, and by abundant bank clams. However none of the logs suggested that the cod ate lobsters. This suggests that abundant cod and lobster populations might be able to exist in the Gulf of Maine at the same time. These conditions may inform management plans aimed at restoring the Gulf of Maine marine ecosystem.

The findings are an important step in being able to better implement what is known as an ecosystem-based management approach to restoring depleted fisheries. Writing in *Fish and Fisheries*, the researchers note that "since 2000, virtually every major assessment of ocean policy has called for implementing an ecosystem approach to managing marine resources," but crafting such an approach has proven difficult. As populations of over-fished species decline dramatically worldwide, marine ecosystems exhibit less and less of the abundance and complexity found in the past. Yet, historical data are hard to assimilate into complex ecosystem models.

"Fishermen have always been keen observers. Frenchman's Bay fishermen 140 years ago provided daily catch numbers in their logs, and they also described the ecosystem that supported cod in such abundance. Our work shows that not only are catch data important, but the descriptions provide significant information about the marine environment," says lead author Karen Alexander, a researcher with the Ocean Process and Analysis Laboratory of the UNH Institute for the Study of Earth, Oceans, and Space.

Historian Jeff Bolster, an associate professor of history at UNH, notes that "the *Fish and Fisheries* article is the most interdisciplinary of any historical fisheries paper published to date." It represents one of the first times a working group has described a historical ecosystem using landings records.

Using logbook data of Gulf of Maine fishermen, the researchers estimated cod landings in the Gulf of Maine in 1861, established a population structure for cod at that time, and mapped the geographical distribution of a fleet that minimized risk and cut expenses by fishing inshore where cod and bait species were plentiful.

Alexander adds, "Ecosystem-based management needs long-term, place-based data on species interactions, such as predator-prey relationships, in order to be successful. Policy-makers also need to know how people have affected the Gulf of Maine over time, and what benefits they've gotten in return. Historical information provides the background we need to make good decisions about the future. It encourages us to set high goals for restoring cod and other marine species vital to a healthy Gulf of Maine ecosystem and also to a healthy fishing economy."

In addition to Alexander and Bolster, UNH co-authors are William B. Leavenworth, historical research coordinator for the Gulf of Maine Cod Project; Jamie Cournane, doctoral candidate in natural resources and Earth systems sciences; Andrew B. Cooper, formerly a research associate professor at OPAL, now associate professor at Simon Fraser University; Stefan Claesson, former head of the Institute for Maritime History, now coordinator of HMAP's Global Mapping Initiative centered at UNH; Andrew A. Rosenberg, professor of natural resources and Earth systems sciences and former director of the Ocean Process Analysis Lab; and former UNH students Lesley Rains, Robert Gee, Stephen Brennan, Gwynna Smith, Tristan K. Law, Katherine Magness, and René Dunn.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.

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